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PLANETARY PHENOMENA FOR NOVEMBER AND DECEMBER, 1907.

BY MALCOLM McNEILL.

PHASES OF THE MOON, PACIFIC TIME.

New Moon....	Nov. 5, 2 ^h 39 ^m P.M.	New Moon....	Dec. 5, 2 ^h 22 ^m A.M.
First Quarter..	" 12, 9 14 A.M.	First Quarter..	" 11, 6 16 P.M.
Full Moon.....	" 19, 4 4 P.M.	Full Moon.....	" 19, 9 55 A.M.
Last Quarter...	" 27, 8 21 P.M.	Last Quarter...	" 27, 3 10 P.M.

The Sun reaches the winter solstice and winter begins December 22d, 4 P.M., Pacific time.

Mercury is an evening star on November 1st, not very far from greatest east elongation, which it passed late in October, but eastern elongations during the last half of the year give a very poor opportunity for seeing the planet as an evening star. The interval between the setting of the Sun and of the planet is less than an hour on November 1st, and diminishes steadily until conjunction in the early morning of November 14th. At this time *Mercury* is in transit across the disk of the Sun. The principal phases of the transit in Pacific time are as follows:—

Ingress, exterior contact,	November 14, 2 ^h 24 ^m A.M.
Ingress, interior contact,	" " 2 26 A.M.
Least distance of centers 12' 38"	" " 4 7 A.M.
Egress, interior contact,	" " 5 47 A.M.
Egress, exterior contact,	" " 5 50 A.M.

The planet will pass over the north half of the Sun. It will be seen that the transit is practically over at sunrise in the extreme western part of the country, and therefore cannot be seen there, but the latter half of the phenomenon can be seen from the central and eastern parts, the Sun rising after the beginning of transit. The next transit will occur in 1914. Transits of *Mercury* are of little scientific interest.

After November 14th *Mercury* is a morning star, and moves rapidly out toward greatest west elongation, reaching it on the morning of December 1st. It will then rise an hour and three quarters before sunrise, and the interval will not be less than an hour until some days after the middle of the month. It will therefore be an easy object to see in the twilight on

early December mornings. By the end of the month the planet will not be far from superior conjunction with the Sun.

Venus is an evening star throughout the month, and shortly after November 1st remains above the horizon long enough after sunset to be easily seen in the evening twilight. On December 1st the interval is a little more than an hour, and by the end of the month it has increased to two hours. Although it is in the part of its orbit farthest from the Earth, it will be a conspicuous object in the evening twilight.

Mars, although it has lost very much of its brilliancy, is still a conspicuous object in the southwestern sky in the evening. During November and December it changes its time of setting only twenty-four minutes, from 11^h 11^m P.M. to 10^h 47^m P.M. It moves 38° eastward and 16° northward from the middle of *Capricorn* through *Aquarius* into *Pisces*. On the morning of December 31st it is in conjunction with *Saturn*, passing 1° 50' north of that planet. During the two months its distance from the Earth increases from 85 to 127 millions of miles, and its brightness at the end of the period is less than one half of that at the beginning, but it is in a region barren of bright stars, and there will be no difficulty in identifying it. *Saturn* is the only bright object near, and its dull yellow color distinguishes it easily from the ruddy color of *Mars*.

Jupiter rises a little before 11^h 30^m P.M. on November 1st, at 9^h 30^m P.M. on December 1st, and at about 7^h 20^m P.M. on December 31st. It is therefore getting around again into good position for evening observation. It moves about 5° eastward and 1° southward up to the end of November, and during December moves a little westward in the constellation *Cancer*.

Saturn sets somewhat earlier, but still remains in good position for evening observation. On November 1st it sets at about 2^h 30^m A.M., on December 1st at about 12^h 30^m A.M., and on December 31st at about 10^h 30^m P.M. It moves westward a little up to November 25th, and then moves eastward, making about 1° by December 31st. It is in the western part of the constellation *Pisces*. Throughout the two months the Sun and the Earth remain on opposite sides of the plane of the rings, and we look toward the dark face, but by the end of December the Earth has nearly reached the plane of the rings once more, and they are nearly edgewise toward us.

During January the Earth will cross the plane and be on the same side as the Sun. This condition of affairs will then continue for fifteen years.

Uranus is in the southwestern sky in the evening, setting a little after 8^h 30^m P.M. on November 1st, at 6^h 45^m P.M. on December 1st, and at 4^h 56^m P.M. on December 31st, only a few minutes after sunset. It will reach conjunction with the Sun early in January, 1908. Its faintness and low altitude will make it a difficult object to see at any time during the two-month period. It is still in *Sagittarius*, and moves about 3° westward. On December 11th it is in conjunction with *Venus*, the latter being 59' to the south.

Neptune is in *Gemini*, and rises about 9 P.M. on November 1st and at about 5 P.M. on December 31st.

(FIFTY-NINTH) AWARD OF THE DONOHOE
COMET-MEDAL.

The Comet-Medal of the Astronomical Society of the Pacific has been awarded to M. GIACOBINI, of Nice, France, for his discovery of an unexpected comet on March 9, 1907.

Committee of the Comet-Medal:

W. W. CAMPBELL,

C. D. PERRINE,

SAN FRANCISCO, September 23, 1907.

CHAS. BURCKHALTER.

(SIXTIETH) AWARD OF THE DONOHOE COMET-
MEDAL.

The Comet-Medal of the Astronomical Society of the Pacific has been awarded to Mr. MELLISH, of Madison, Wisconsin, for his discovery of an unexpected comet on April 14, 1907.

Committee of the Comet-Medal:

W. W. CAMPBELL,

C. D. PERRINE,

SAN FRANCISCO, September 23, 1907.

CHAS. BURCKHALTER.

(SIXTY-FIRST) AWARD OF THE DONOHUE
COMET-MEDAL.

The Comet-Medal of the Astronomical Society of the Pacific has been awarded to M. GIACOBINI, of Nice, France, for his discovery of an unexpected comet on June 2, 1907.

Committee of the Comet-Medal:

W. W. CAMPBELL,

C. D. PERRINE,

SAN FRANCISCO, September 23, 1907.

CHAS. BURCKHALTER.

(SIXTY-SECOND) AWARD OF THE DONOHUE
COMET-MEDAL.

The Comet-Medal of the Astronomical Society of the Pacific has been awarded to ZACCHEUS DANIEL, of Princeton, New Jersey, for his discovery of an unexpected comet on June 9, 1907.

Committee of the Comet-Medal:

W. W. CAMPBELL,

C. D. PERRINE,

SAN FRANCISCO, September 23, 1907.

CHAS. BURCKHALTER.
